Claims:

1. A catalyst capable of supporting combustion beyond the fuel rich limit of flammability comprising a catalytic component and a metallic support wherein the support is a metallic structured packing comprising a multiplicity of open-ended channels and which has been loaded with a non metallic coating.

2. A catalyst as claimed in claim 1, wherein the catalyst component comprises a Group VIIIB metal.

3. A catalyst as claimed in claim 1 or claim 2, wherein the metallic support is selected from FeCrAlY, NiCrAlY, CoCrAlY, Ni-Chrome, Inconel and Monel.

4. A catalyst as claimed in any one of the preceding claims, wherein the metallic support is in the form of a foam having a pore size in the range of 10 pores per inch (ppi) to 100ppi.

5. A catalyst as claimed in any one of claims 1 to 4, wherein the metallic support is in the form of a monolith having between 2000cpi (cells per inch) to 5cpi.

6. A catalyst as claimed in any one of the preceding claims, wherein the metallic support comprises a series of blocks or layers that tessellate together to leave no gaps.

7. A catalyst as claimed in any one of the preceding claims, wherein the non metallic coating is a ceramic material selected from alumina, silica-alumina, a combination of alumina and mullite, lithium aluminium silicate, cordierite, silicon carbide, zirconia toughened alumina, partially stabilized zirconia, fully stabilized zirconia, spinel, chromia, titania, aluminium titanate, or any combination of the above.

8. A catalyst as claimed in any one of the preceding claims, wherein the non-metallic has been loaded onto the support by any one of the following methods; aluminizing,

chemical vapour deposition, sputter coating and washcoating.

9. A catalyst as claimed in claim 8, wherein washcoating is used to provide the non-metallic coating on the metallic support.

10. A process for the production of an olefin, said process comprising passing a mixture of a hydrocarbon and an oxygen-containing gas over a catalyst as claimed in any one of claims 1 to 9.

11. A process as claimed in claim 10, wherein hydrogen is co-fed with the hydrocarbon and oxygen-containing gas to the reaction zone.

12. A process as claimed in claim 10 or claim 11, wherein a non catalytic resistance zone is located upstream of the catalyst.

13. A process as claimed in any one of claims 10 to 12, wherein the ratio of hydrocarbon to oxygen-containing gas is 5 to 16, times the stoichiometric ratio of hydrocarbon to oxygen-containing gas required for complete combustion of the hydrocarbon to carbon dioxide and water.

14. A process as claimed in any one of claims 10 to 13, wherein the process is operated at a pressure of between 10-30barg.